IN THE CLAIMS:

Please cancel claims 1, 2 and 39 and amend claims 48 and 55 so that the claims hereafter read as follows:

1.-2. (Canceled)

3. (Previously Presented) An apparatus for assessing physiological function in an individual comprising:

a sensor, said sensor comprising:

a stimulator shaped to fit a first anatomical site, said stimulator configured to generate a stimulus and apply said stimulus to stimulate a nerve at said first anatomical site;

a detector shaped to fit a second anatomical site, said detector comprising a plurality of electrodes each configured to detect a signal generated in response to said stimulus; and

flexible connecting means structurally connecting said stimulator to said detector with said stimulator and detector being spaced a predetermined distance from one another, said connecting means including electrical conductors coupled to said stimulator and said detector, said connecting means being shaped so as to automatically position said detector substantially adjacent to said second anatomical site when said stimulator is positioned substantially adjacent to said first anatomical site.

4. (Original) The apparatus of claim 3 wherein said sensor is shaped to fit a lower extremity of said individual.

5. (Original) The apparatus of claim 4 wherein said lower extremity comprises the foot.

6. (Previously Presented) The apparatus of claim 3 further comprising a processor coupled to said detector for processing at least one signal generated in response to said stimulus that is characteristic of said second anatomical site.

7. (Original) The apparatus of claim 3 wherein said physiological function comprises nerve conduction.

8. (Original) The apparatus of claim 7 wherein said nerve conduction comprises conduction of the tibial nerve.

9. (Original) The apparatus of claim 7 wherein said nerve conduction comprises conduction of the peroneal nerve.

10. (Original) The apparatus of claim 3 wherein said stimulator comprises a shape to fit said first anatomical site, wherein said first anatomical site comprises a superficial location over the peroneal nerve, and said detector comprises a shape to fit said second anatomical site, wherein said second anatomical site comprises a superficial location over the extensor digitorum brevis muscle of the foot.

11. (Original) The apparatus of claim 3 wherein said stimulator comprises a shape to fit said first anatomical site, wherein said first anatomical site comprises a superficial

location over the tibial nerve, and said detector comprises a shape to fit said second anatomical site, wherein said second anatomical site comprises a superficial location over the abductor hallucis muscle of the foot.

12. (Original) The apparatus of claim 3 wherein said first anatomical site comprises the ankle ipsilateral to said second anatomical site.

13. (Original) The apparatus of claim 3 further comprising a positioning indicator for location over a third anatomical site.

14. (Original) The apparatus of claim 11 wherein said third anatomical site comprises the malleolus of the ankle joint.

15. (Original) The apparatus of claim 14 wherein said malleolus is ipsilateral to said second anatomical site.

16.-17. (Canceled)

18. (Original) The apparatus of claim 3 wherein said electrodes comprise an electrode array in communication with a processor.

19. (Original) The apparatus of claim 18 wherein said electrode array comprises at least two independent interleaved bipolar recording elements.

20. (Original) The apparatus of claim 3 wherein said signal comprises a compound muscle action potential.

21. (Original) The apparatus of claim 20 wherein said compound muscle action potential is recorded over a motor point.

22. (Previously Presented) The apparatus of claim 3 wherein the weighted sum of the recordings of at least two of said electrodes comprises the detectable signal.

23. (Previously Presented) A method for assessing physiological function in an individual, comprising:

(a) placing a sensor on an individual, said sensor comprising a stimulator, a detector, and a flexible connector formed integral with and serving as a mechanical and electrical connection between said stimulator and said detector:

said stimulator being shaped to fit a first anatomical site and configured to generate a stimulus and apply said stimulus to stimulate a nerve at said first anatomical site;

said detector being shaped to fit a second anatomical site, said detector comprising a plurality of electrodes each configured to detect a response signal generated at said second anatomical site in response to said stimulus; and

said connector being configured to automatically position said detector substantially adjacent to said second anatomical site when said stimulator is placed substantially adjacent to said first anatomical site on the surface of an individual; and

(b) performing nerve conduction studies with at least one of said electrodes to assess physiological function in an individual.

24. (Previously Presented) The method of claim 23 wherein said nerve conduction studies comprises:

(c) processing the response signals detected by said electrodes;

(d) determining from said response signals processed in step (c) at least one electrode detecting a response signal characteristic of said second anatomical site; and

(e) performing said nerve conduction studies of step (b) with said at least one electrode selected in step (d).

25. (Original) The method of claim 23 wherein said nerve conduction studies comprise measurement of an F-wave latency.

26. (Original) The method of claim 23 wherein said nerve conduction studies comprise measurement of a motor latency.

27. (Original) The method of claim 23 wherein said nerve conduction studies comprise measurement of a sensory latency.

28. (Original) The method of claim 23 wherein said nerve conduction studies comprise measurement of a sensory amplitude.

29. (Previously Presented) The method of claim 24 wherein said processing comprises amplitude comparison between a plurality of response signals generated at said second anatomical site.

30. (Previously Presented) The method of claim 24 wherein said processing comprises frequency spectrum comparison between a plurality of response signals generated at said second anatomical site.

31. (Previously Presented) The method of claim 23 wherein at least one response signal generated at said second anatomical site comprises peripheral evoked potentials.

32. (Original) The method of claim 29 wherein said amplitude comparison comprises maximal peak to peak amplitude.

33. (Previously Presented) The method of claim 30 wherein said frequency spectrum comparison comprises discrete Fourier transform analysis of said plurality of response signals generated at said second anatomical site and comparison of the spectral components of said plurality of response signals.

34. (Previously Presented) The method of claim 33 wherein selected electrodes comprise electrodes with more energy at low frequencies.

35. (Previously Presented) The method of claim 23 wherein at least one signal generated at said second anatomical site comprises compound muscle action potential.

36. (Previously Presented) The method of claim 23 wherein at least one signal generated at said second anatomical site is recorded over a motor point.

37. (Previously Presented) An apparatus for assessing physiological function in an individual, comprising:

stimulus means for producing a stimulus and for applying the stimulus at a first anatomical site to stimulate a nerve;

detecting means comprising a plurality of electrodes for detecting at least one response signal characteristic of a second anatomical site generated in response to said stimulus; and

connecting means for connecting said stimulus means and said detecting means, said connecting means being configured to automatically position said detecting means substantially adjacent said second anatomical site when said stimulating means are positioned substantially adjacent said first anatomical site;

said apparatus comprising multiple layers of materials including a flexible base layer that forms part of said stimulus means, said detecting means and said connecting means.

38. (Previously Presented) The apparatus of claim 37 further comprising electrical processing means for processing said at least one response signal detected by said detecting means.

39. (Canceled)

40. (Previously Presented) An apparatus for assessing physiological function in an individual comprising:

a sensor, said sensor comprising:

a stimulator shaped to fit a first anatomical site, said stimulator generating a stimulus whereby application of said stimulus stimulates a nerve at said first anatomical site;

a detector shaped to fit a second anatomical site, said detector comprising a plurality of electrodes for detecting signals generated at said second site in response to stimulation of a nerve at said first anatomical site;

flexible connecting means structurally connecting said stimulator to said detector with said stimulator and detector being spaced a predetermined distance from one another, said connecting means including electrical conductors coupled to said stimulator and said detector, said connecting means being shaped so as to automatically position said detector substantially

adjacent to said second anatomical site when said stimulator is positioned substantially adjacent to said first anatomical site;

said physiological function comprising conduction of the peroneal nerve.

41. (Previously Presented) An apparatus for assessing physiological function in an individual comprising:

a sensor, said sensor comprising:

a stimulator shaped to fit a first anatomical site, said stimulator generating a stimulus whereby application of said stimulus stimulates a nerve at said first anatomical site; and

a detector shaped to fit a second anatomical site, said detector comprising a plurality of electrodes for detecting a signal generated in response to said stimulus;

wherein said sensor automatically positions said detector substantially adjacent to said second anatomical site when said stimulator is positioned substantially adjacent to said first anatomical site; and

wherein said stimulator comprises a shape to fit said first anatomical site, wherein said first anatomical site comprises a superficial location over the peroneal nerve, and said detector comprises a shape to fit said second anatomical site, wherein said second anatomical site comprises a superficial location over the extensor digitorum brevis muscle of the foot.

42. (Previously Presented) An apparatus for assessing physiological function in an individual comprising:

a sensor, said sensor comprising:

a stimulator shaped to fit a first anatomical site, said stimulator generating a stimulus whereby application of said stimulus stimulates a nerve at said first anatomical site; and

a detector shaped to fit a second anatomical site, said detector comprising a plurality of electrodes for detecting a signal generated in response to said stimulus;

wherein said sensor automatically positions said detector substantially adjacent to said second anatomical site when said stimulator is positioned substantially adjacent to said first anatomical site; and

wherein said stimulator comprises a shape to fit said first anatomical site, wherein said first anatomical site comprises a superficial location over the tibial nerve, and said detector comprises a shape to fit said second anatomical site, wherein said second anatomical site comprises a superficial location over the abductor hallucis muscle of the foot.

43.-44. (Canceled)

45. (Previously Presented) An apparatus for assessing physiological function in an individual comprising:

a sensor, said sensor comprising:

a stimulator shaped to fit a first anatomical site, said stimulator generating a stimulus whereby application of said stimulus stimulates a nerve at said first anatomical site; and

a detector shaped to fit a second anatomical site, said detector comprising a plurality of electrodes for detecting a signal generated in response to said stimulus;

wherein said sensor automatically positions said detector substantially adjacent to said second anatomical site when said stimulator is positioned substantially adjacent to said first anatomical site; and

wherein said first anatomical site comprises the ankle ipsilateral to said second anatomical site.

46. (Previously Presented) An apparatus for assessing physiological function in an individual comprising:

a sensor, said sensor comprising:

a stimulator shaped to fit a first anatomical site, said stimulator generating a stimulus whereby application of said stimulus stimulates a nerve at said first anatomical site; and

a detector shaped to fit a second anatomical site, said detector comprising a plurality of electrodes for detecting a signal generated in response to said stimulus;

wherein said sensor automatically positions said detector substantially adjacent to said second anatomical site when said stimulator is positioned substantially adjacent to said first anatomical site; and

wherein said signal comprises a compound muscle action potential.

47. (Previously Presented) The apparatus of claim 46 wherein said compound muscle action potential is recorded over a motor point.

48. (Currently Amended) A method for assessing physiological function in an individual, comprising:

(a) providing a sensor comprising:

a stimulator for generating a nerve stimulus, said stimulator being shaped to fit a first anatomical site whereby application of said stimulus stimulates a nerve at said first anatomical site; and

a detector shaped to fit a second anatomical site, said detector comprising a plurality of electrodes each capable of detecting a signal generated at said second anatomical site in response to said stimulus applied at said first anatomical site; and

a flexible connector ~~means~~ connecting said stimulator to said detector to form an integral structure;

said flexible connector ~~means~~ being shaped to automatically position said detector substantially adjacent to said second anatomical site when said stimulator is placed substantially adjacent said first anatomical site on the surface of an individual;

(b) placing said sensor on an individual so that said stimulator is located at and fits said first anatomical site and said detector is located at and fits said second anatomical site; and

(c) performing nerve conduction studies with said sensor to assess physiological function in an individual, said studies comprising (1) causing said stimulator to generate a stimulus on said individual at said first anatomical site, (2) causing said electrodes of said detector to detect response signals generated

at said second anatomical site in response to said stimulus applied at said first anatomical site, and (3) evaluating said response signals;

(d) processing the response signals generated at said second anatomical site and detected by said electrodes to select at least one electrode detecting a response signal characteristic of said second anatomical site; and

(e) performing the nerve conduction studies specified in step (c) with the at least one electrode selected in step (d).

49. (Previously Presented) The method of claim 48 wherein said processing further comprises amplitude comparison between a plurality of response signals generated at said second anatomical site.

50. (Previously Presented) The method of claim 49 wherein said amplitude comparison comprises maximal peak to peak amplitude.

51. (Previously Presented) The method of claim 48 wherein said processing comprises frequency spectrum comparison between a plurality of response signals generated at said second anatomical site.

52. (Previously Presented) The method of claim 51 wherein said frequency spectrum comparison comprises discrete Fourier transform analysis of said plurality of response signals

generated at said second anatomical site and comparison of the spectral components of said response signals.

53. (Previously Presented) The method of claim 52 wherein said at least one selected electrode comprises electrodes with more energy at low frequencies.

54. (Previously Presented) The method of claim 48 wherein each of said response signals generated at said second anatomical site comprises peripheral evoked potentials.

55. (Currently Amended) A method for assessing physiological function in an individual, comprising:

(a) placing a sensor on an individual, said sensor comprising:

a stimulator shaped to fit a first anatomical site, said stimulator generating a stimulus whereby application of said stimulus stimulates a nerve at said first anatomical site;

a detector shaped to fit a second anatomical site, said detector comprising a plurality of electrodes for detecting a signal generated at said second site in response to said stimulus; and

a flexible connector ~~means~~ connecting said stimulator to said detector so as to form an integrated structure;

wherein said flexible connector ~~means~~ automatically positions said detector substantially adjacent to said second anatomical site when said stimulator is placed substantially

adjacent said first anatomical site on the surface of an individual; and

(b) performing nerve conduction studies with at least one electrode to assess physiological function in an individual by causing said stimulator to generate a stimulus to a nerve at said first site, causing said electrodes of said detector to detect a response signal generated at said second site in response to said stimulus, and processing and measuring said response signals;

wherein said nerve conduction studies comprise measurement of an F-wave latency.

56. (Previously Presented) A method for assessing physiological function in an individual, comprising:

(a) placing a sensor on an individual, said sensor comprising:

a stimulator shaped to fit a first anatomical site, said stimulator generating a stimulus whereby application of said stimulus stimulates a nerve at said first anatomical site; and

a detector shaped to fit a second anatomical site, said detector comprising a plurality of electrodes for detecting a response signal generated at said second site in response to said stimulus;

wherein said sensor automatically positions said detector substantially adjacent to said second anatomical site when said stimulator is placed substantially adjacent said first anatomical site on the surface of an individual; and

(b) performing nerve conduction studies with at least one electrode to assess physiological function in an individual by causing said stimulator to generate a stimulus to a nerve at said first site, causing said electrodes of said detector to detect a response signal generated at said second site in response to said stimulus, and processing and measuring said response signals;

wherein said nerve conduction studies comprise measurement of a motor latency.

57. (Previously Presented) A method for assessing physiological function in an individual, comprising:

(a) placing a sensor on an individual, said sensor comprising:

a stimulator shaped to fit a first anatomical site, said stimulator generating a stimulus whereby application of said stimulus stimulates a nerve at said first anatomical site; and

a detector shaped to fit a second anatomical site, said detector comprising a plurality of electrodes for detecting a response signal generated at said second anatomical site in response to said stimulus;

wherein said sensor automatically positions said detector substantially adjacent to said second anatomical site when said stimulator is placed substantially adjacent said first anatomical site on the surface of an individual; and

(b) performing nerve conduction studies with at least one electrode to assess physiological function in an individual

by causing said stimulator to generate a stimulus to a nerve at said first site, causing said electrodes of said detector to detect a response signal generated at said second site in response to said stimulus, and processing and measuring said response signals;

wherein said nerve conduction studies comprise measurement of a sensory latency.

58. (Previously Presented) A method for assessing physiological function in an individual, comprising:

(a) placing a sensor on an individual, said sensor comprising:

a stimulator shaped to fit a first anatomical site, said stimulator generating a stimulus whereby application of said stimulus stimulates a nerve at said first anatomical site; and

a detector shaped to fit a second anatomical site, said detector comprising a plurality of electrodes for detecting a response signal generated in response to said stimulus;

wherein said sensor automatically positions said detector substantially adjacent to said second anatomical site when said stimulator is placed substantially adjacent said first anatomical site on the surface of an individual; and

(b) performing nerve conduction studies with at least one electrode to assess physiological function in an individual by causing said stimulator to generate a stimulus to a nerve at said first site, causing said electrodes of said detector to

detect a response signal generated at said second site in response to said stimulus, and processing and measuring said response signals;

wherein said nerve conduction studies comprise measurement of a sensory amplitude.

59. (Previously Presented) A method for assessing physiological function in an individual, comprising:

(a) placing a sensor on an individual, said sensor comprising:

a stimulator shaped to fit a first anatomical site, said stimulator generating a stimulus whereby application of said stimulus stimulates a nerve at said first anatomical site; and

a detector shaped to fit a second anatomical site, said detector comprising a plurality of electrodes for detecting a response signal generated in response to said stimulus;

wherein said sensor automatically positions said detector substantially adjacent to said second anatomical site when said stimulator is placed substantially adjacent said first anatomical site on the surface of an individual; and

(b) performing nerve conduction studies with at least one electrode to assess physiological function in an individual by causing said stimulator to generate a stimulus to a nerve at said first site, causing said electrodes of said detector to detect a response signal generated at said second site in

response to said stimulus, and processing and measuring said response signals;

wherein said response signals generated at said second anatomical site comprise compound muscle action potential.

60. (Previously Presented) A method for assessing physiological function in an individual, comprising:

(a) placing a sensor on an individual, said sensor comprising:

a stimulator shaped to fit a first anatomical site, said stimulator generating a stimulus whereby application of said stimulus stimulates a nerve at said first anatomical site; and

a detector shaped to fit a second anatomical site, said detector comprising a plurality of electrodes for detecting a response signal generated in response to said stimulus;

wherein said sensor automatically positions said detector substantially adjacent to said second anatomical site when said stimulator is placed substantially adjacent said first anatomical site on the surface of an individual; and

(b) performing nerve conduction studies with at least one electrode to assess physiological function in an individual by causing said stimulator to generate a stimulus to a nerve at said first site, causing said electrodes of said detector to detect a response signal generated at said second site in response to said stimulus, and processing, recording and measuring said response signals;

wherein at least one signal generated at said second anatomical site is detected by an electrode situated over a motor point.

61. (Previously Presented) An apparatus for assessing physiological function in an individual comprising:

a sensor, said sensor comprising:

a stimulator shaped to fit a first anatomical site, said stimulator generating a stimulus whereby application of said stimulus stimulates a nerve at said first anatomical site;

a detector shaped to fit a second anatomical site, said detector comprising a plurality of electrodes for detecting signals generated in response to said stimulus; and

flexible connecting means structurally connecting said stimulator to said detector with said stimulator and detector being spaced a predetermined distance from one another, said connecting means including electrical conductors coupled to said stimulator and said detector, said connecting means being shaped so as to automatically position said detector substantially adjacent to said second anatomical site when said stimulator is positioned substantially adjacent to said first anatomical site;

said sensor being formed from multiple layers of material including a base layer in the form of a sheet of flexible plastic material and a layer of conductive traces connected to said stimulator and said electrodes, with said base layer forming an integral part of said stimulator, said detector and said flexible connecting means.

62. (Previously Presented) Apparatus according to claim 61 wherein said sensor includes an electrical interface that also comprises said base layer, and further including an electronic controller coupled by said electrical interface to said stimulator and said electrodes, said controller being adapted to (a) cause said stimulator to generate a stimulus and (b) selectively receive and process response signals detected by said electrodes.